

## Weather Note

### OBSERVATION OF A HORIZONTAL CLODBOW

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J. E. McDonald [1] described a cloudbow seen during a jet airplane flight from Honolulu to Los Angeles in September 1961, reminding the writer of a similar observation made on a jet flight over the Atlantic Ocean in November of the same year. The flight, from Frankfurt to New York, took place on November 5, 1961; and the cloudbow was observed in the vicinity of Paris and to the westward over the British Isles, during a period roughly a half hour either side of local noon. My notes state that there was a 9/10 to 10/10 altocumulus layer, top estimated at 20,000 to 25,000 ft., lower broken to overcast stratocumulus layer, and a clear, bright sky above. The flight altitude was 31,000 ft.

I estimated the cloudbow's radius to be about  $40^\circ$ , and its width at  $5^\circ$ . The primary bow was accompanied by an inner supernumerary. The primary bow was grayish-white in color, but the supernumerary displayed a distinct reddish-brown cast. The dark zone between the two bows was perhaps  $5^\circ$  to  $8^\circ$  in width. The cloudbow phenomena were accompanied by a brilliant three-, sometimes four-fold glory, whose total diameter could be estimated fairly accurately as  $1/4$  to  $1/5$  the *radius* of the primary cloudbow.

Since the elevation above the horizon of the sun at noon at this latitude and date is only about  $23^\circ$ , the pri-

mary bow was seen not as an ellipse, as was McDonald's example, but as a hyperbola. The inner supernumerary bow seemed also to be hyperbolic but, interestingly enough, appeared to curve inward, away from the primary bow, near the horizon.

Suspecting that observations of this phenomenon were somewhat rare, I described it to Dr. H. Landsberg at the first opportunity. He agreed about its probable nature and mentioned having heard of a few other examples from pilots of high-flying military aircraft.

Like McDonald, I found my own view of the cloudbow somewhat restricted by the aircraft structure. While I would not, perhaps, go so far as to second McDonald's audacious proposal that jet aircraft be provided with glass bottoms to facilitate meteorological observations, I must nevertheless point out that, owing to the rearward position of the wing on jets, passengers in the after- (or tourist-class) cabin are not likely ever to have an opportunity to see a cloudbow.

#### REFERENCE

1. James E. McDonald, "A Gigantic Horizontal Cloudbow," *Weather*, vol. 17, No. 7, July 1962, pp. 241-245.

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